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Research was conducted to evaluate the effectiveness of a 12-week intervention program of individual instruction for disadvantaged preschool children. Based on this pretest, 17 children with IQ scores of 107 or less were selected and placed into experimental and control groups. The experimental group was exposed to individual cognitive and language development instruction designed to offset lags in intellectual growth commonly identified as effects of socioeconomic disadvantage. Tutorial sessions for each member of the experimental group were scheduled for four 15- to 20-minute periods per week, but only 56 percent of available sessions were utilized. Content of the sessions focused on classification and differentiation. Posttests showed gains for the experimental and control groups of 4.7 and 5.9, respectively. Discussion of these results includes suggestions concerning the selection of children for participation in individual instructional programs, counterindications of the present study, and recommendations regarding patterns of individual teaching assignments. Statistics are reported in two tables, and an appendix contains an enumeration of the content of the tutorial sessions.(JS)

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HEAD START EVALUATION AND RESEARCH CENTER

Progress Report of Research Studies
1966 to 1967
(Documents 1 - 6)

Document 6

INDIVIDUAL INSTRUCTION PROJECT 1

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INDIVIDUAL INSTRUCTION PROJECT 1

Background of Project

Individual Instruction Project 1 owes its inception to the work of Marion Blank* with preschool disadvantaged children described in an unpublished manuscript (pre-publication draft), "Individual Teaching of Language for Abstract Thinking." Briefly, this work consists of individual tutoring aimed at "helping the child to develop an abstract language system which he would readily turn to in all problem-solving tasks." Four children out of a classroom group of 12 received daily individual tutoring for three months. Concepts taught included number, direction, speed, size, temporal sequence, facial expressions, body parts and functions. Pre- and post-test results with the Stanford-Binet showed a mean I.Q. gain of 18 points for the experimental group while test results of the control subjects in the same class showed no or very little gain.

Purpose

The purpose of this project was to provide individual instruction in cognitive and language areas to offset lags commonly identified as effects of socio-economic disadvantage on intellectual development. It was expected that the addition of individual instruction in specific content would help to focus children on the uses and usefulness of abstract concepts and on the language for these concepts. Further, it was hoped that children might emulate the adult whose exclusive attention they possessed in using language as a way of ordering experience and communicating with others.

The use of the label "Project 1" expresses the hope that such exploration of methods of individual instruction in language concepts will be continued in the

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future at the Early Childhood Center, as part of the Center's service to preschool children as well as a vehicle for study of children's attitudes toward particular techniques for cognitive advancement.

Method of Study

Individual Instruction Project 1 consisted of an intensive tutoring program on a one-to-one basis of nine three- and four-year-old children attending the Bank Street College Early Childhood Center.

The Stanford-Binet LM was administered to a pool of 49 children in attendance during a five-day testing period. Based on this pre-test, 17 children with I.Q.s below 107 were selected and placed into two groups, an experimental (N = 9) and a control group (N = 8). The experimental group was exposed to the instructional tutoring program. The control group was not exposed to this program. Both experimental and control groups were retested with the Stanford-Binet LM at the completion of this three-month project. The major portion of pre-testing (approximately 35 out of 49 cases) and most of the post-testing (15) was administered by one examiner who did not participate in any other way in this project and therefore did not know the identity of the experimental or control groups. The remaining tests were administered by the Project Director, who did not tutor any of the children she tested.

Child Population

In selecting children with I.Q.s below 107, we expected to reach those whose cognitive development had presumably suffered from the effects of environmental deprivation. While a lower cut-off point (I.Q. = 100) was considered preferable, it was not possible to obtain the desired number of children in this I.Q. range.

The mean initial I.Q. of the experimental group was 92.7; the mean I.Q. of the control group was 95.9. This very slight difference may be accounted for by the loading of greater learning problems in the experimental group related to the

"service orientation"* of the Center which led inadvertently to inclusion of the neediest, least adaptive children in the experimental group.

Frequency of Tutoring Sessions

Eight children in the experimental group were scheduled for four 15-20 minute sessions weekly. Total number of sessions for these eight children ranged from 20 to 29 with a mean of 25 sessions representing only 56% of available sessions over three months. One child was on a three sessions per week schedule. This child received only a total of 15 sessions.

Staff

Project 1 was staffed by a project director (half-time), an advisor** who worked with one child for several initial sessions for exploratory purposes, and by one full- and one part-time student teacher. An additional teacher*** was included several weeks after the program started.

The Teaching Task

How were the children to be taught? Does teaching of color, size, relationships, etc., promote an enriched conceptual approach or just convey a few pieces of information (i.e., how transferable is this learning)? How can new modes of thinking be made meaningful to those children in the group who showed no apparent curiosity for extending and clarifying experience through words? What was to be the teaching approach in a short-term intensive and "achievement oriented" (I.Q. gains) program?

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*This was not intended but "happened" when two children dropped out of the originally selected group and were replaced.

**Blanche Saia

***Bea Baron

The brief time unit of instruction (15-20 minutes) and the three-month time limit imposed the need for strategies to increase instructional opportunity, e.g., restriction of alternatives open to the child, restriction of space, "instant" boosts to motivation, insistence on task completion, devices for reducing anxiety.

What constitutes readiness for learning abstract language concepts? Readiness for which concepts? Chronological age, initial language status, apparent intellectual level, test estimate of intellectual functioning, perceptual motor function and other behavioral clues of maturity level were used to assess level of readiness. The pertinent use of these clues depended on the experience and intuition of the teacher-observer. This still left us with intuitive-empirical guidelines regarding the hierarchies of abstraction. It was in this crucial area of the work that the need for more preparation in advance of a project of this type seemed greatest. Teachers were often unable to reduce the level of difficulty of a task. They had difficulty preparing a sufficient variety of graded sub-steps of increasing complexity.*

The teachers in this project are, by temperament and training, committed to the idea that learning should be experienced by the child as a need-fulfilling process and not as an implacable adult demand. This psychodynamic orientation, which commits the teacher to a participating rather than an authoritative role, tends to conflict with the use of pressure to yield maximal short-term results. The specific measurable goal (I.Q. gains) imposed by Project 1 gave rise to the need for strategies of teaching which at times seemed incompatible with the teacher's perception of her function in promoting learning as a gratifying, need-fulfilling experience.

Furthermore, when a psychodynamic orientation is practiced by beginning

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*Marion Blank reported last spring that a "Manual" for Individual Instruction is in preparation.

teachers, the teacher's approach tends to suffer from vagueness, hesitation, and unreliable limits. When this was hastily corrected by the teacher because of the requirement of the project, the child was confronted by abrupt shifts of approach from soft to firm, or from suppression of infantile needs to indulgence of these needs, which confused him further.

In this project, an incompatibility of teaching aims was experienced particularly when children resisted the teacher or when the teachers were at a loss how to teach a concept. Those children who found the experience gratifying seemed to promote the coherence and consistency of the teacher's approach.

Content and Materials

Content of the sessions focused on classification and differentiation as ways of ordering and mastering experience: e.g., size, quantity, sensory quality, location, temporal sequence, relationships (see Appendix). Toys, miscellaneous materials, as well as the persons of teacher and child were used for the application of these concepts. For example, an assortment of small rubber animals was used for classification: kind of animal, families, adult and young, for relative size, for counting and for spatial orientation concepts. Plastic chips and felt circles were used for teaching colors, sizes and numbers. Hide-and-seek games required location concepts and provided suspense and the gratification of mastery over unknowns.

Some experimental play and instructional materials provided by Bank Street Publications* offered novelty and were useful for focusing on the temporal sequence of action, on stages of growth, on cause and effect. However, less elaborately prepared materials seemed to serve equally well.

The persons of teacher and child and a mirror were used to develop a language of self-awareness, differentiation and mood expression.

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*Prepared for group use in Head Start programs.

Use of Space

Activities were limited to a small room in which a table and floor mat served as play areas. Restriction of space for the 15-minute session was one method for focusing the child on the subject of the session. Roaming and exploring of larger spaces were discouraged. The staircase and trips through the building (usually related to the child's return to the classroom) were used to teach spatial concepts.

Results

As shown in Table 1, modest I.Q. gains occurred in both groups. However, the control group showed a slightly higher change (1.2) than the instruction group. Compared with a mean I.Q. gain of 18 points for Blank's four subjects, these results are disappointing indeed. When compared with the mean gain of less than two points in Blank's control group, the mean gain of 5.9 obtained by E.C.C. control children suggests that cognitive growth might be fostered more in one school environment than in another. Further, the gains of the control group suggest that the children of Project 1 may have made cognitive advances which are measurable in I.Q. terms before the start of individual instruction. The children comprising the instruction and control groups were not school beginners. Average length of school attendance for these children at initial testing was 7 months with a range of 3 to 12 months. The children in Blank's study represent the "youngest class." Length of school experience prior to project start is not indicated.

Discussion and Conclusions

Evaluation of the type of educational intervention tried in Project 1 is hampered by the fact that the required rigor, clarity and control of an experimental procedure could not be maintained. The inception of the program was hasty. The teaching of children, teaching of student teachers and explorations in teaching abstract concepts to young children took place concurrently with a relatively large

group of teachers and children. In addition, the staff encountered resistance from classroom teachers who resented their exclusion from the project and saw their protective role conflicting with the tutor's insistence that children leave the classroom at appointed times.

Since Project 1 was not intended as a replication of Blank's work, the results obtained do not reflect on her method. Our experience, however, raises doubts as to whether service-oriented programs duplicating this or other methods can obtain the I.Q. gains achieved in an experimental situation. This does not reflect on the usefulness of this educational procedure, but rather on the type of evaluation imposed upon it.

Experience with Project 1 does not support Blank's optimism concerning the moderate cost per child of this type of program. Her estimate of 1½ hours per child per week does approximate child time invested in the project but does not seem to be a realistic estimate of <u>teacher time</u>. Even if as much as one third of teacher time were allotted to preparation, transitions and supervision, a work load of approximately 20 children for a 30-hour week over a school year would seem highly improbable. Individual work with young children who are to be held to a curriculum that does not always meet their interest is arduous. Our experience in this respect would contra-indicate a full-time teacher assignment for this task. Assignment patterns combining individual teaching with other duties for the full-time person may need to be evolved. Also, when the program is released from experimental restrictions, the participation by the children's classroom teacher in planning and coordinating teaching goals with the special teacher can be a very positive aspect of the intervention with feedback for both classroom and individual instruction.

It has become fashionable in the middle 1960's to attempt educational intervention at young ages with children from "disadvantaged" backgrounds. The success of such interventions is often documented by I.Q. gains obtained by single before-

after measures. The terms "gain," "increase" and "acceleration" are used interchangeably, perhaps, to avoid language monotony. "Acceleration," however, seems to be the least applicable of these terms and yet may represent an assumption that is hidden by the other terms. "Acceleration" suggests that a change in pace of intellectual growth is taking place. In effect, I.Q. gains derived from the comparison of two single measures (before-after) may reflect nothing more than improved test-taking ability, and increased awareness of the high value of giving the right answer. While these changes may represent increasing social maturity and the acquisition of attitudes which have a positive influence on subsequent school performance, these I.Q. changes do not necessarily represent an increase in the power to solve problems or a broadening of the cognitive range in a child. Yet changes of this type are associated with the meaning of I.Q. gains.

An evaluation that includes not one, but at least two pre-test I.Q. scores (with the same instrument) separated by a suitable time interval and two post-test also separated in time might tell us more about the meaning of the I.Q. change.

Another issue which is relevant to any type of special educational intervention is the selection of children expected to profit from it. The assumption that any child (who has experienced culture-linked deprivation of intellectual stimuli) can profit from an intensive individual tutoring program in abstract thinking scaled to his maturity level is open to question.

It has not been our experience that all children were helped or even "at least not harmed" by frequent confrontations with an adult insisting upon a new frontier of thinking. When long-range dynamic goals were ignored in favor of specific immediate goals, reactions that were negative to the purpose of the project seemed to intensify. For example, the post-test rejection by two children, resulting in two missing I.Q. scores (see Table 2), was the last gesture of an accelerating defiance and resistance observed in these two children throughout the project's

duration. Strategies to counteract the resistance of these children in terms of rule enforcement, the use of authority, meeting oral needs, insuring success, reducing level of abstraction, changing duration of work time, all failed. The fact that numerous approaches were attempted in a relatively short period of time might in itself have perpetuated the failure to reach these two children. In their classroom, these children have continued to practice their negative, resistive stance against the world. Children whose view of the world has been frozen into a chronic stance of angry resistance, lusty at times and miserable at others, but persistent, are not likely to respond well to an intensive and short-term intervention into their ways and habits.

At the other extreme, one docile little boy (Marvin), who was eager to please and who sought his identity in the crumbs of approval offered him by others, seemed to swallow all that was given and regurgitate it in a fashion that indicated a weakening rather than a strengthening of independent thinking.

Several children flourished in this tutoring situation. One active, agitated, restless little girl (Paulette), who liked to play with words but did not use them for effective communication (pre-test I.Q. 82), improved dramatically in the course of the project (post-test I.Q. 105), becoming increasingly able to organize thoughts in sentences and articulate them in comprehensible fashion. The I.Q. increase of 23 points parallels the dramatic improvement in this child's use of words and abstract concepts as a means of ordering her world and functioning in it with more direction and greater satisfaction. At ages 3.5 to 3.8, Paulette was the youngest child in the instructional group.*

Amanda, 4.9, who was fearful, cried, sucked her thumb, roamed and withdrew in her classroom, could communicate effectively from the start of the project. Work

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*Paulette was one of two children who had attended school only three months prior to the individual instruction project.

with Amanda consisted of a series of devices for need gratification and need channeling through conceptual activities. She represented a "natural" for any brand of therapeutic tutoring (her I.Q. increased 11 points). It would seem that "individual instruction" here served to strengthen a pre-existing coping device in which language was used as an important tool for communication and for problem solving.

Summary and Recommendation

A 12-week program of Individual Instruction in Abstract Concepts at the Early Childhood Center was carried out by two student teachers and evaluated by means of comparing pre and post Stanford-Binet Test results. While the I.Q. scores in the instructional group showed a mean gain of 4.7, slightly higher gains occurred in the control group that had not received special instruction. This suggests that the total school program at E.C.C. has an accelerating effect on the intellectual development of the children, but that the addition of Individual Instruction, as practiced in Project 1, did not increase I.Q. scores. The possible meaning of these results are discussed, and some suggestions made concerning selection of children, counterindications, and patterns of individual teaching assignments.

While individual instruction in abstract concepts with young children may not always lead to quick I.Q. gains, it does seem an enterprise worthy of further exploration. Among its merits and potential uses are the following:

1. A curriculum and methodology for teaching abstract concepts can be developed with intentional feedback to the classroom.

2. As a tool for teacher training as well as for child learning. It can be of great value in teacher preparation for teaching young disadvantaged students.

3. "Individual Instruction" provides a close-up on various forms of child approach to and child resistance against cognitive change, if one can separate this from the child's attitudes to the teacher and method. Further, it creates an

urgency on the teacher's part to understand child behavior and to cope with it in terms of curriculum and method changes.

4. "Individual Instruction" can serve research interests as well, particularly by providing a unit for observing the effects of intervention techniques in teaching of abstract thinking.

Table 1

Stanford-Binet LM Test Retest Results

	Date	N	Age Range	Mean Age	Mean M.A.	I.Q. Range	Mean I.Q.	I.Q. Change
Instruction Group								
Pre-test	4-67	9	3-5 - 4-9	4-0	3-9	82-103	92.7	+4.7
Post-test	7-67	7*	3-8 - 4-11	4-3	4-3	85-109	97.4	
Control Group								
Pre-test	4-67	9	3-11 - 5-1	4-6	4-4	84-107	95.9	+5.9
Post-test	7-67	9	4-2 - 5-4	4-9	4-6	92-115	101.8	

*Two children persistently refused re-testing. (If these two children are removed from the pre-test group, the average initial I.Q. for remaining seven subjects is 93.5; the I.Q. change 3.9)

Table 2

Pre- and Post-Test Results
Stanford-Binet LM

Group	Subject	Age (Pre-test)	M.A. (Pre-test)	M.A. (Post-test)	I.Q. (Pre-test)	I.Q. (Post-test)	I.Q. Change
Instruct:	Paulette	3-5	2-10	3-11	82	105	+23
	Betty	3-6	3-4	no data*	94	no data*	no data*
	Marvin	3-10	3-8	3-10	94	93	-1
	Donald L.	3-11	3-3	3-8	82	85	+3
	Ruth	3-11	4-1	4-2	103	99	-4
	Ralph	4-1	4-3	4-2	103	95	-8
	Doris	4-2	3-7	no data*	85	no data*	no data*
	George	4-5	4-2	4-6	93	96	+3
	Amanda	4-9	4-8	5-4	98	109	+11
Control:	Lily	3-11	4-2	4-10	105	115	+10
	Ken	3-11	4-0	4-5	100	107	+7
	Lila	4-3	4-6	4-9	107	107	0
	Donald R.	4-4	4-2	4-3	95	94	-1
	Florence	4-6	3-11	4-4	86	92	+6
	Albert	4-7	3-11	5-2	84	107	+23
	Andy	4-10	4-9	5-5	98	107	+9
	Kippy	4-11	4-6	4-11	90	94	+4
	Carl	5-1	5-0	5-3	98	98	0

*Child rejected post-test.

APPENDIX

"Concepts"

Quantity:

a) relationships -- big and little
bigger and littler
tall and short
taller and shorter
more and less
small, middle-sized, big (3 bears)

b) numbers -- up to 5
(finger games, number rhymes, counting objects)

Direction:

up-down
over-under
on-top -- underneath
at the top-on the bottom

left-right (too hard for children under 5?)

a) use locations and furniture for concepts

b) use sheet of paper for top and bottom and middle

Sequence:

first comes, then (or next)
first-last
before-after

sequence of the day
sequence of events (causal relationships)

Reference to objects, acts and events in their absence:

begin with objects (finding-game)

Events:

weather and its effect on people (clothing, shelter needs, activities)
birthday -- birth of the child (related to season -- to birth of siblings?)
school, after school, school vacation
sickness
holidays

Times of the Day:

what happens at lunch time
at going home time
on the roof, etc.

(avoid talk about events you cannot verify)

PS 001077

Similarities (differences):

alike -- you have shoes, the doll has shoes
different -- your shoes are bigger than the doll's
(may be too young to understand difference)

Similarities (and differences, if useable) on direct experience level. Do not use abstractions such as "fruit," "furniture" unless child experiences the sorting into categories (see below).

Sorting, Categorizing:

Arrange miniature objects in families or as "things that go together" (e.g., box of miniature furniture, foods, people, animals).

Shapes: Use puzzles ("Fit a Shape") to discuss words that describe shapes (round, straight, lines, corners, box shape, circle, cross, etc.)